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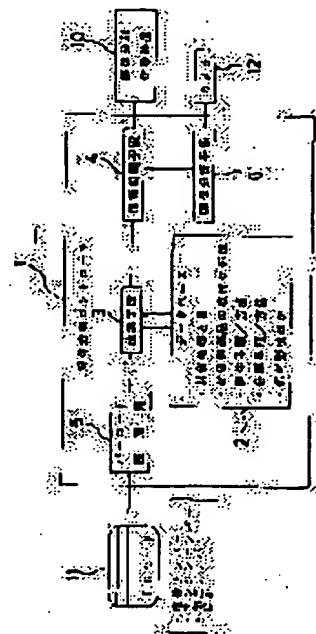
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## (54) METHOD FOR PROVIDING OVERHAUL AND CLASSIFICATION DATA AND OVERHAUL-CLASSIFICATION METHOD

### (57)Abstract:

**PURPOSE:** To conduct efficiently operations of overhaul and recovery of classified materials on the basis of data by storing in a data bank data on materials and mounting positions by products or parts and operation data on procedures and methods for overhaul and classification and retrieving and outputting required data using product classification information.

**CONSTITUTION:** A data base 2 of an overhaul-classification controller 1 stores data by the models of motorcycles on kinds and amounts of materials, mounting positions of parts by materials, procedures and methods for overhaul, procedures and methods for disassembly, forms of members, etc. On the other hand, data on body numbers, engine numbers, part numbers and data for identifying other products are written in an ID card 11 by bar codes etc. When a motorcycle to be overhauled is set on an overhaul-classification operation apparatus 10, and a bar code reader reads the bar code of the ID card 11, a retrieval means 3 retrieves the data base 2 and extracts the material and operation data for required products to send them to a data processing means 4, so that practical control signals are output to the overhaul-classification operation apparatus 10.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The demolition judgment information offer method characterized by accumulating information, such as the quality of the material and an anchoring part, the work information on a procedure and a method which carries out demolition judgment according to a product or parts at the data bank, inputting the product identification information which discriminates a product, and searching and outputting necessary information from the aforementioned data bank based on the inputted product identification information.

[Claim 2] The demolition judgment method of carrying out extracting the parts which canceled combination of parts and were disassembled according to a product or parts based on the demolition judgment information searched from the data bank which accumulated information, such as the quality of the material and an anchoring part, the work information on a procedure and a method which carries out demolition judgment based on the demolition judgment information searched from the aforementioned data bank, and carrying out demolition processing as the feature.

[Claim 3] data bank information -- referring to -- a discernment means -- a resin -- the demolition judgment method characterized by discriminating the quality of the material of a member, \*\*\*\*(ing) the resin member by which discernment was carried out [ aforementioned ] by the \*\*\*\* means, conveying alternatively the resin member by which \*\*\*\* was carried out [ aforementioned ] for every same quality of the material by the conveyance means, and containing for every same quality of the material by the receipt means

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the offer method of the demolition judgment information for decomposing and mainly, collecting industrial products for every material, and automatic demolition judgment equipment.

[0002]

[Description of the Prior Art] Conventionally, depending on a product, it applies to shredder, and grinds, this is divided into a metal and other objects by specific gravity judgment, a metal is turned to recycling, and other objects have an art, such as using for reclamation etc. as dust.

[0003] However, generally, since various resin metallurgy groups and liquids are intermingled, a help decomposes in demolition, and it divides roughly into a metal and a resin, and the method of collecting for every quality of the material with the processor of exclusive use is taken by industrial products, such as a domestic electrification product and a motor bicycle, (refer to JP,61-38641,A as an example).

[0004]

[Problem(s) to be Solved] In the stage of such conventional demolition judgment work, there are some which the state of the thing or the interior which distinction of a material does not attach does not understand, and decline in the efficiency of decomposition work and the efficiency of collection by type was caused. Moreover, distinguishing, even if there is a reusable thing is difficult for plastics etc., it is altogether processed as dust after all, and cannot aim at effective use of resources. That acquisition of still more exact demolition judgment information cannot be performed had barred automation of demolition judgment work.

[0005] this invention was made in view of this point, and the place made into the purpose is in the point of offering the method and the demolition judgment method of receiving information easily since it is another a dissolved part.

[0006]

[Means for Solving the Problem and its Function] In order to attain the above-mentioned purpose, invention of \*\*\*\* 1 accumulated information, such as the quality of the material and an anchoring part, the work information on a procedure and a method which carries out demolition judgment according to a product or parts at the data bank, and was taken as the demolition judgment information offer method which inputs the product identification information which discriminates a product, and searches and outputs necessary information from the aforementioned data bank based on the inputted identification information.

[0007] If the product identification information of the product which it is going to disassemble is inputted, since necessary information, such as information, such as the quality of the material and an anchoring part, and work information on the procedure and the method of carrying out demolition judgment, will be searched and outputted according to a product from the data bank based on the information, based on the necessary information, demolition judgment work can be done efficiently and fine collection for every quality of the material by type is enabled.

[0008] The 2nd invention can cancel combination of parts based on the necessary information on the data bank, and can be automatically collected by extracting the disassembled parts. While the 3rd invention can perform conveyance and the receipt for every trituration and quality of the material one by one based on the necessary information on the data bank and being able to raise the recovery of a resin, reduction-ization can be attained and improvement in space efficiency can be aimed at.

[0009]

[Example] One example of this invention illustrated to drawing 1 and drawing 3 below is explained. this example is an example applied to the automatic demolition judgment equipment of a motor bicycle, and drawing 1 is the system configuration view of the control system.

[0010] The work device 10 which carries out demolition judgment of the motor bicycle is controlled by the

demolition judgment controller 1; it has the data bank 2 which accumulated product information, an information processing means processes the information from which the reference means 3 searched and extracted this data bank 2, and the demolition judgment controller 1 outputs a control signal to the demolition judgment work device 10.

[0011] The identification information of the motor bicycle set as the object of demolition is written in ID card 11 as a bar code, and the demolition judgment controller 1 is equipped with the bar code reading machine 5 which reads the bar code of this ID card 11.

[0012] Moreover, it has an image analysis means 6 for the image information from a camera 12 which projects the state of a motor bicycle to be inputted into the demolition judgment controller 1, and to analyze this picture, and an analysis result is sent to the information processing means 4, and correction of work is presented with it. Control of the demolition judgment work device 10 is made under the above system configurations.

[0013] the aforementioned database 2 -- the kind of quality of the material, an amount, the anchoring part of the parts according to quality of the material and a demolition procedure, a method and a decomposition procedure, a method, and a member -- data, such as a configuration, are accumulated for every kind of motor bicycle, and a maker side creates the recycling data according to a model and parts, and inputs the aforementioned data into the database 2 based on this recycling data

[0014] in addition, about the quality of the material, it roughly divides into a metal, rubber, and a resin -- having -- a metal -- an iron system, aluminum, copper, and lead -- in addition -- while being divided finely -- a resin -- PP system, PE system, an AES system, and a ABS system -- in addition to this, it is classified finely, and data, such as an attachment part, and a decomposition procedure, a method, are inputted about each

[0015] On the other hand, the information which can discriminate the product of a body number, an engine number, a part number, and others is written in ID card 11 by the bar code etc.

[0016] Therefore, the motor bicycle disassembled to the demolition judgment work device 10 is set, and if the bar code reading machine 5 is made to read the bar code of ID card 11 concerning this motor bicycle, based on the read product identification information, the reference means 3 will search a database 2, will extract the quality-of-the-material data and work data of this required product, and will transmit to the information processing means 4.

[0017] The information processing means 4 outputs a concrete control signal to the demolition judgment work device 10 based on the above-mentioned quality-of-the-material data and work data, and controls demolition judgment work.

[0018] In addition, there is a part which the motor bicycle with which demolition is presented is not maintaining all the states of a new car at the beginning, and deforms, or attached parts are attached, and is different from shipment that time, in order to check these, the camera 12 is formed, and the image information which the camera 12 copied is analyzed by the image analysis means 6, and is outputted to the information processing means 4.

[0019] The manipulation routine by the information processing means 4 is explained according to drawing 2 below. The information which the reference means searched first is incorporated (Step 1). As described above, work data, such as quality-of-the-material data, such as a kind of quality of the material and an attachment part, and a demolition procedure, a method, are contained in reference information.

[0020] And the image analysis information analyzed by the image analysis means 6 is read (Step 2), and the aforementioned reference information and image analysis information are collated (Step 3).

[0021] It is the information which analyzed in three dimensions in which position image analysis information would have a certain member for the actual information which analyzed and obtained the image information which the camera 12 obtained to it being shown with the positional information which is three dimensions that reference information is in a predetermined, the information, for example, the predetermined member, of specification \*\*\*\*\*, attachment part, for example.

[0022] This 3-dimensional position determines two predetermined parts (in for example, the case of a two automatic vehicle pivot of a rear fork etc.) of a product, and is determined by numeric data about each part material on the basis of this.

[0023] Next, if it progresses to Step 4, and the state of a member will distinguish whether the state of specification is maintained on the basis of 60% of maintenance factors and will become 60% or more about it, it will fly to Step 7 and drive control of the demolition judgment work device 10 will be performed under the reference information on original. If it seems that a state maintenance factor is less than 60% at Step 4, it will progress to Step 5, reference information will be corrected, and drive control of the demolition judgment work device 10 will be performed under fix information text (Step 6).

[0024] About the demolition judgment work device 10, the external view is shown in drawing 3. In addition, the demolition judgment work device 10 is adjoined, the demolition judgment controller 1 is

installed, and the camera 12 is also arranged. Set-up support of the motor bicycle 20 with which the oblong conveyance base 21 is presented by demolition is carried out at the two-set column.

[0025] The five robot arm 22 is arranged along the conveyance base 21 at both sides, as for one, a drill 23 is equipped at the nose of cam of one near two robot arm 22, and, as for one, it is now equipped with the disc grinder 24.

[0026] To the conveyance base 21, the robot hand 26 to which in the near three robot arm 22 of another side it has a milling cutter 25 at the one nose of cam, and other two can grasp parts at the nose of cam is equipped, and the judgment box 27 is arranged behind these robot arm 22. The judgment box 27 is divided for every quality of the material of the parts thrown in.

[0027] If a motor bicycle 20 stops now in the predetermined position which it is put on the conveyance base 21, is conveyed, and is shown in drawing 2 The identification information of this motor bicycle 20 is read from ID card 11. about this motor bicycle 20 Quality-of-the-material data, The reference means 3 searches work data from a database 2. based on this reference information Moreover, if required, as described above, based on fix information text, the information processing means 4 will output a sequential control signal to the necessary robot arm 22 according to a demolition procedure from work data first, and will begin demolition by the drive of the robot arm 22 based on the output signal.

[0028] The bolt which has combined parts cuts the head of a bolt with a milling cutter 25, and makes removal possible. Subsequently, disassembly of each device is also performed if needed, and the parts which can be removed by this demolition and decomposition process are demounted by the robot hand 26, and are thrown in in the judgment box 27 according to the quality of the material of the part.

[0029] As mentioned above, if the demolition judgment equipment of this example inputs the product identification information of ID card 11 into the demolition judgment controller 1, since all the back performs demolition judgment automatically, it is cut down sharply and an effort does not need to do the work by the help in an inferior environment.

[0030] Moreover, since the quality of the material of parts can also be classified finely, classifies PP system, PE system, an AES system, and a ABS system also about resin material, respectively and can be collected, it can reproduce to preparation and recycling efficiency can be raised.

[0031] About the demolition judgment work device 10, as shown in drawing 4 as the modification, a motor bicycle 30 is carried and supported on a turntable 31, and the robot arm 32 equipped with the milling cutter 33 or the robot hand 34 at the nose of cam is arranged around the turntable 31.

[0032] A motor bicycle 30 can change the posture over the robot arm 32 by rotation of a turntable 31, and demolition judgment work can be done efficiently, performing a normal rotation inversion suitably.

[0033] Moreover, the example shown in drawing 5 forms the support frame 41 which encloses a motor bicycle 40 to a gate type, and it is made to attach the work machine 42 in the perpendicular frame of right and left of this support frame 41, and the level frame of a ceiling free [ movement ].

[0034] For example, it has a milling cutter 43 and robot hand 44 grade at a nose of cam, and work machine 42 selves can go up and down the work machine 42 attached in the perpendicular frame up and down. Moreover, it is attached in a level frame, and a soffit is equipped with robot hand 45 grade, and it can go up and down the work machine 42 selves up and down while the work machine 42 is also movable to right and left.

[0035] The susceptor 46 of a motor bicycle 42 is movable suitably forward and backward, after working in a predetermined order position, it moves to either approximately, and it does the next work.

[0036] Since a robot hand 45 exists up, a member can be demounted upwards and it is convenient depending on the kind of product.

[0037] Although ID card 11 is given by making product identification information into a bar code and it was made to read with a bar code reading vessel in the above example, you may make it read with a magnetic reading vessel using a magnetic card, and may make it read a mark etc. optically.

[0038] Furthermore, it stamps on the start key of this motor bicycle etc., and you may make it read this. There is also the method of indicating in the automobile inspection proof, even if it does not create a bar code etc. as a card separately.

[0039] This explanation of the ability of demolition judgment to be presented as one product also about each device parts not only after demolition judgment of a finished product but demolition is natural.

[0040] Therefore, sticking a seal, the information, for example, the bar code, which can discriminate the part number and other products, etc. on the suitable part which cannot separate easily is also considered about each part article. Moreover, it is also discriminable with the stamp of the part number etc.

[0041] In addition, this invention is applicable not only to vehicles but almost all the industrial product. Moreover, although the above example showed the example which controls the automatic demolition machine 10, making it copy out necessary information on monitor television by making an information processing means into an image-processing means among the aforementioned demolition judgment

controllers 1, and always looking at the information, it is also possible to carry out demolition judgment by the handcraft, and it is useful in the place in which the large-scale automatic demolition machine 10 cannot be installed.

[0042] Next, another example illustrated to drawing 6 and drawing 7 is explained. If this example starts the resin material collection equipment of a plant by type and each process of the work in this equipment is summarized, it will become like drawing 6.

[0043] As for the resin parts 51, the kind of resin is first discriminated based on the information on a database 50 at the discernment process 52. That is, the resin parts 51 are discriminated by five kinds, a ABS system, an AES system, PP system, PE system, and others, in this example.

[0044] And crushing of these resin parts 51 is carried out at the crushing process 53, and they are cut by the suitable wafer. This will be removed if the piece of a metal of an iron system etc. is contained at this time. Subsequently, it conveys alternatively to the grinder of exclusive use of five kinds of resin parts 1 discriminated at the aforementioned discernment process 52 by the selection conveyance process 54 in every kind.

[0045] And it is finely ground at the trituration process 55 by each grinder, and a series of collection work at the receipt process 56 by type is ended to the storage tank of exclusive use, respectively. In addition, by the time the trituration process 55 is back-contained, a fine iron system metal will be removed.

[0046] The sketch of the resin material collection equipment equipped with each above process by type is shown in drawing 7.

[0047] The detection equipment 61 which detects the kind of resin which hits the discernment process 52 first, and the crushing equipment 62 which hits the crushing process 53 are located in a line, and is formed, if it turns to back from crushing equipment 62, a band conveyor 63 is installed, and five grinders 64 which hit the trituration process 55 along with this band conveyor 63 are arranged. the storage tank 66 which a magnet 65 is made to intervene corresponding to each grinder 64, is alike, and hits the receipt process 56 is arranged, respectively

[0048] Moreover, in the middle of a band conveyor 63, five shutters 67 are arranged free [ opening and closing ], and nothing and each shutter 67 correspond the selection conveyance process 4 to five grinders 64, respectively.

[0049] A projector 72 is arranged up and the electric eye 73 is arranged below so that detection equipment 61 may be the place where the resin parts 61 are carried in first, two band conveyors 70 and 71 may stand in a row in a column and infrared light may pass through the gap between both.

[0050] If the resin parts 51 are carried in on the band conveyor 70 of an upstream among the band conveyors 70 and 71 which rotate in the same direction mutually, although it will be moved to the band conveyor 71 of a downstream by rotation of a band conveyor 70 When the resin parts 51 pass through between both, the infrared light of a projector 72 is received, the transmitted light goes into an electric eye 73, the information on the transmitted light is inputted into an analyzer 74, an absorption spectrum is analyzed by the analyzer 74, and the quality of the material of the resin parts 51 is distinguished.

[0051] From the band conveyor 71 of a downstream, the resin parts 51 are transferred to the tooth-rest board 80 of crushing equipment 62. The guillotine cutter 81 is formed above the tooth-rest board 80 free [ two or more sheet rise and fall ], it descends and the resin parts 51 on the tooth-rest board 80 are cut.

[0052] The resin parts 51 by which fragmentation crushing was carried out to plurality are moved by the knockout of an ejector plate 82 on a band conveyor 63. Although the resin parts 1 are conveyed by rotation of a band conveyor 63, there is a place which the shutter 67 predetermined by the middle closed, and the shutter 67 is contacted.

[0053] Since a shutter 67 interrupts the way of the resin parts 51 aslant to the conveyance direction on a band conveyor 63, the resin parts 51 which contacted move leftward along with this shutter 67, and are thrown into the opening of the grinder 64 which turned opening to the edge of a band conveyor 63.

[0054] Five shutters 67 are closed when the resin of a ABS system, an AES system, PP system, PE system, and others has been conveyed sequentially from an upstream, and they are in the state where rocked up and it opened, except it.

[0055] Control of these shutters 67 is performed to predetermined timing based on the kind of resin material judged by analysis of the analyzer 74 of the aforementioned detection equipment 61. For example, an analyzer 74 will judge this as the resin parts carried in on the band conveyor 70 being the things of an AES system, crushing of these AES system resin parts is carried out with crushing equipment 62, when it is moved to a band conveyor 63 and conveyed, from an upstream, the 2nd shutter 67 will be rocked below, and will close, and AES system resin parts will be fed [ \*\* ] into the 2nd grinder 64 in the way of this AES system resin.

[0056] Although the resin parts 1 are ground still more finely and discharged by the storage tank 66 in a grinder 64, a magnet 65 is up by the middle, metals, such as iron, are inhaled, and it is stuck, is removed

and only resin material is supplied in a storage tank 66.

[0057] Five storage tanks 66 are the same with the sequence of a shutter 67, and the resin of a ABS system, an AES system, PP system, PE system, and others is accumulated sequentially from the upstream of the conveyance direction of a band conveyor 63. In addition, resins other than the four aforementioned kind, the resin whose discernment of a kind was not completed, and metals are paid in the storage tank 66 of others of the lowest style.

[0058] Since each storage tank 66 dedicates the ground resin, volume efficiency is very good and can make an installation space small. A resin can be automatically collected by type according to a kind and the value reproduced and reused can be raised.

[0059] Next, the example which equipped vehicles with this resin material collection equipment by type is shown and explained to drawing 8 and drawing 9. Truck 100 of this example Driver's seat 101 Back loading platform 102 The collection equipment by type is installed and the means of each process has the same arrangement relation with the same equipment as the aforementioned example.

[0060] Namely, loading platform 102 It is detection equipment 111 to a posterior part. Crushing equipment 162 It is prepared side by side and is crushing equipment 112. Shell front driver's seat 111 If it turns, it is a band conveyor 113. It is installed and is this band conveyor 113. It meets and they are five grinders 114. It is arranged and is each grinder 114. It corresponds and is a magnet 115. It is made to intervene and is a storage tank 116. It is arranged, respectively.

[0061] Moreover, band conveyor 113 In the middle, they are five shutters 117. It is arranged free [ opening and closing ] and is each shutter 117. Five grinders 114 It corresponds, respectively. each equipment -- the aforementioned example -- the same -- detection equipment 111 Covering device material 103 the place where it rocks up, and it opens and resin parts are carried in first -- it is -- two band conveyors 120 and 121 it stands in a row in a column, and infrared light passes through the gap between both -- as -- the upper part -- a projector -- the electric eye is arranged caudad

[0062] Band conveyor 121 of a downstream A shell is crushing equipment 112. Tooth-rest board 130 It is transferred and resin parts are the tooth-rest boards 130. In the upper part, it is the guillotine cutter 131. It is prepared free [ two or more sheet rise and fall ], and is the tooth-rest board 130. It descends and the upper resin parts are cut.

[0063] The resin parts by which fragmentation crushing was carried out to plurality are oil hydraulic cylinders 133. It is a band conveyor 113 by the knockout of the ejector plate 82 to drive. It is moved upwards. Oil hydraulic cylinder 133 Hydraulic power package 134 Drive control is carried out.

[0064] Detection equipment 111 Shutter 117 which corresponds based on a kind recognition signal The resin parts concerned are band conveyors 113 to the closed place. When carried, it is this shutter 117. It is the grinder 114 with which it is led and resin parts correspond. It is supplied and ground and, subsequently is a magnet 115. Storage tank 116 which an iron system metal is removed and corresponds It is contained.

[0065] and storage tank 116 if it is the container formula which can be removed from the body the whole tank and fills -- every tank -- loading platform 102 from -- removing -- a disposal plant -- giving -- instead of -- an empty tank -- carrying -- the next recovery -- the other side -- things are made and shortening of product taking-down time can be attained

[0066] Each storage tank 116 The level sensor is attached, and when it fills, an exchange stage can be told with the warning lamp installed in a driver's seat, the injection section, etc. Storage tank 116 Loading platform 102 It is intensively installed in one side and is convenient for product taking down.

[0067] Since it grinds and carries in the car as mentioned above, the efficiency of materials handling improves sharply. It can turn around the generating place of a resin, can collect, and can collect from a dealer without especially the grinder etc.

[0068] Since a resin can be collected by type according to a kind with detection equipment 61, judgment at reproducing space is unnecessary, and reproduction physical properties are good, and expansion of the added value as reproduction material, i.e., reuse and a use, and improvement in the quality of reproduction material can be aimed at.

[0069] In addition, as a discernment means, there are some which otherwise judge a kind by detection of the irregularity of the front face of a resin, and a judgment may be presented combining what is depended on the aforementioned infrared radiation. It is the aforementioned detection equipment 111 to the place which furthermore gives the bar code which shows a kind beforehand to resin parts, and is carried in first. You may arrange a bar code reading machine as a discernment means instead.

[0070] Moreover, each aforementioned storage tank 116 If it manufactures by the same resin as the kind to dedicate, reproduction can be presented the whole tank at the time of reproduction.

[0071]

[Effect of the Invention] If the product identification information of the product which it is going to



disassemble according to invention of \*\*\*\* 1 is inputted, since necessary information, such as information, such as the quality of the material and an anchoring part, and work information on the procedure and the method of carrying out demolition judgment, will be searched and outputted according to a product from the data bank based on the information, it can dissolve based on the necessary information, and the collection work for every quality of the material by type can be done efficiently.

[0072] Since according to the 2nd invention combination of parts can be canceled and extracted based on the necessary information on the data bank and it can dissolve automatically, increase in efficiency of work and improvement in recovery can be aimed at.

[0073] While according to the 3rd invention being able to perform conveyance and the receipt for every trituration and quality of the material one by one based on the necessary information on the data bank and being able to raise the recovery of a resin, reduction-ization can be attained and improvement in space efficiency can be aimed at.

[0074] Since resin parts are collected by type according to the quality of the material, judgment at reproducing space is unnecessary, reproduction physical properties are good again, and the added value as reproduction material increases.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

[Drawing 1] It is the system configuration view of the control system of the demolition judgment equipment of example concerning this invention.

[Drawing 2] It is the flow chart which shows the manipulation routine of the information processing means of this equipment.

[Drawing 3] It is the external view of this equipment.

[Drawing 4] It is the external view of the demolition judgment work device of another example.

[Drawing 5] It is the external view of the demolition judgment work device of still more nearly another example.

[Drawing 6] Moreover, it is block drawing 1 which shows each routing of the recovery system according to pitch of another example.

[Drawing 7] It is the sketch of the recovery system according to the said pitch.

[Drawing 8] Furthermore, it is the outline plan of the vehicles equipped with the recovery system according to pitch of another example.

[Drawing 9] It is this sectional side elevation.

**[Description of Notations]**

1 [ -- A reference means, 4 / -- Information processing means, ] -- A demolition judgment controller, 2 -- A database, 3 5 [ -- Demolition judgment work device, ] -- A bar code reading machine, 6 -- An image analysis means, 10 11 [ -- A motor bicycle, 21 / -- Conveyance base, ] -- An ID card, 12 -- A camera, 20 22 [ -- Disc grinder, ] -- A robot arm, 23 -- A drill, 24 25 [ -- A judgment box, 30 / -- Motor bicycle, ] -- A milling cutter, 26 -- A robot hand, 27 31 [ -- A milling cutter, 34 / -- A robot hand, 40 / -- A motor bicycle, 41 / -- A support frame, 42 / -- A work machine, 43 / -- 44 A milling cutter, 45 / -- A robot hand, 46 / -- Susceptor. ] -- A turntable, 32 -- A robot arm, 33 50 [ -- A discernment process, 53 / -- Crushing process, ] -- A database, 51 -- Resin parts, 52 54 [ -- A receipt process, 61 / -- Detection equipment, ] -- A selection conveyance process, 55 -- A trituration process, 56 62 [ -- A grinder, 65 / -- Magnet, ] -- Crushing equipment, 63 -- A band conveyor, 64 66 [ -- Band conveyor, ] -- A storage tank, 67 -- 70 A shutter, 71 72 [ -- An analyzer, 80 / -- A tooth-rest board, 81 / -- Guillotine cutter, ] -- A projector, 73 -- An electric eye, 74 82 -- An ejector plate and 100 -- A truck and 101 -- A driver's seat and 102 -- Loading platform, 103 -- covering device material and 114 -- A grinder and 115 -- A magnet and 116 -- Storage tank, 117 -- shutter, 120, and 121 -- band conveyor and 130 -- A tooth-rest board and 131 -- A guillotine cutter and 132 -- An ejector plate and 133 -- An oil hydraulic cylinder and 134 -- Hydraulic power package.

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